

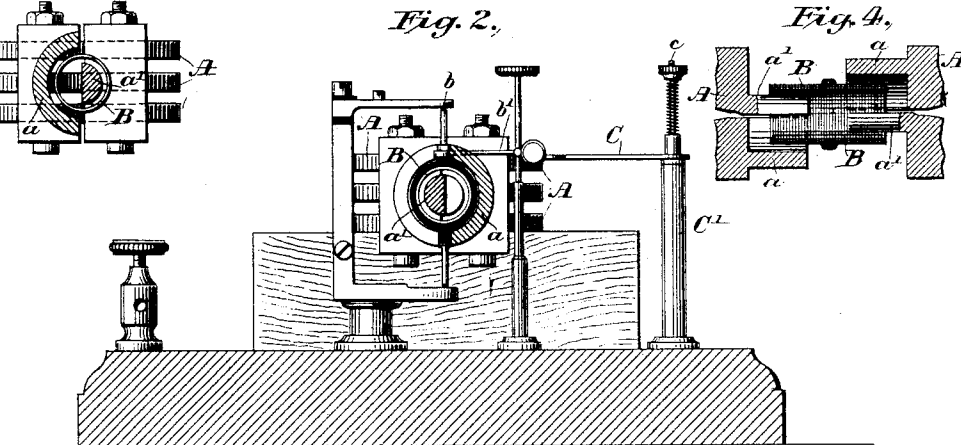
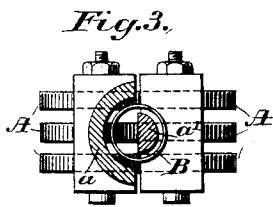
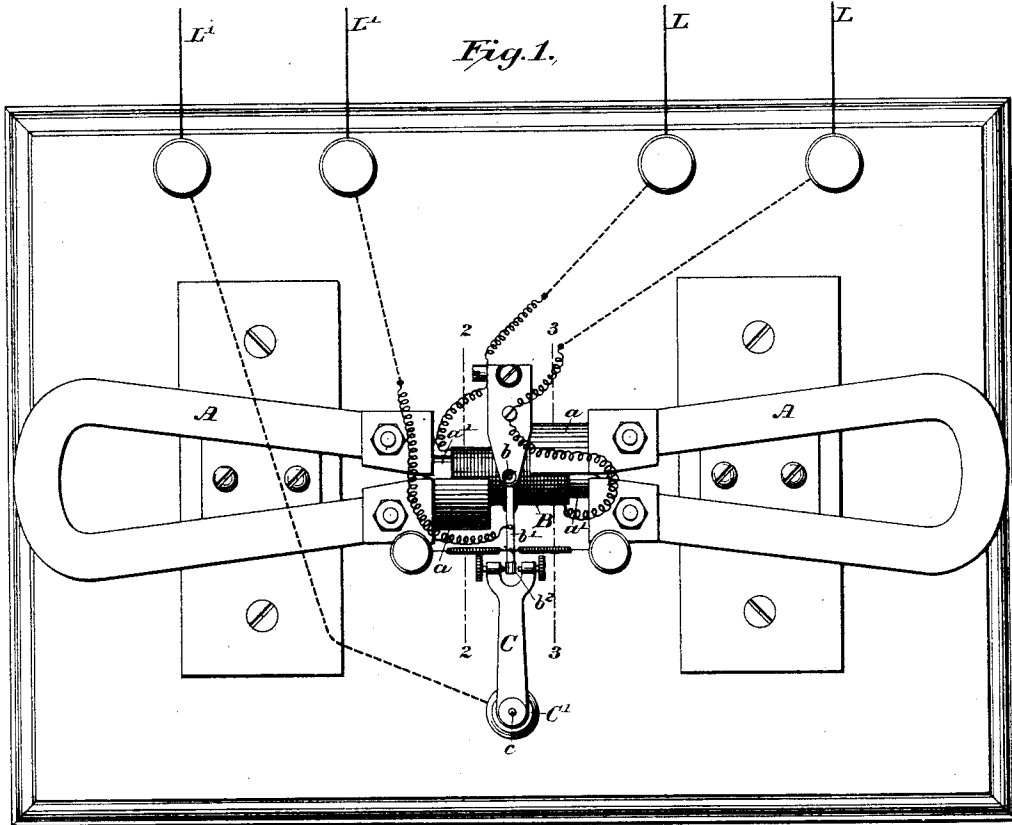
(No Model.)

2 Sheets—Sheet 1

C. G. BURKE.
TELEGRAPH INSTRUMENT.

No. 402,717.

Patented May 7, 1889.



Witnesses,
Geo. W. Breech.
Carrie E. Ashley

Inventor,
Chas. G. Burke
By his Attorneys
Pope, Cogcomb & Duray

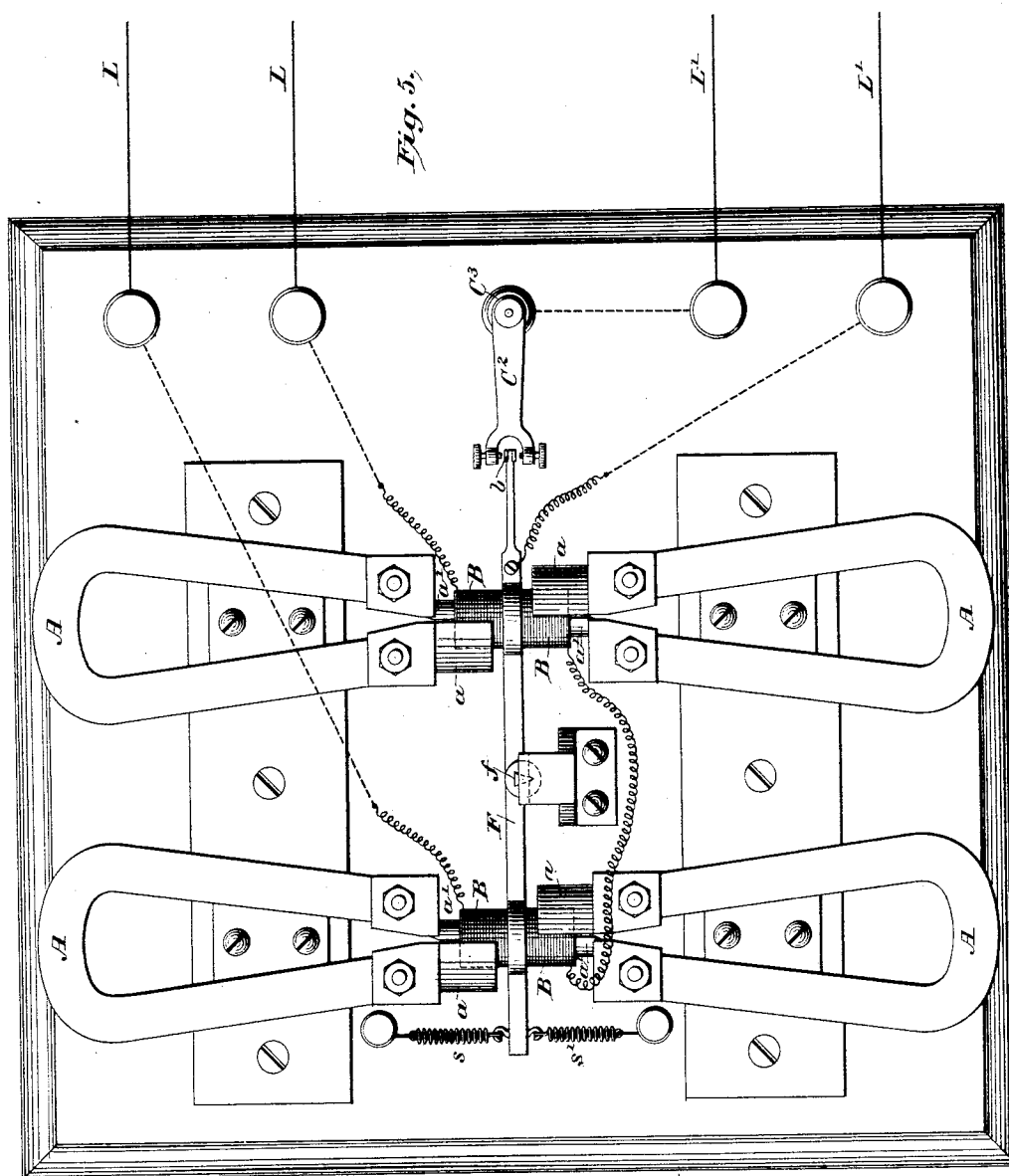
(No Model.)

2 Sheets—Sheet 2.

C. G. BURKE.
TELEGRAPH INSTRUMENT.

No. 402,717.

Patented May 7, 1889.



Witnesses
Geo. W. Brock.
Carrie E. Oakley

Inventor,
Chas. G. Burke
By his Attorneys
Pope, Edwards & Perry

UNITED STATES PATENT OFFICE.

CHARLES G. BURKE, OF RICHMOND HILL, NEW YORK.

TELEGRAPH-INSTRUMENT.

SPECIFICATION forming part of Letters Patent No. 402,717, dated May 7, 1889.

Application filed September 8, 1888. Serial No. 284,891. (No model.)

To all whom it may concern:

Be it known that I, CHARLES G. BURKE, a citizen of the United States, residing in Richmond Hill, in the county of Queens and State of New York, have invented certain new and useful Improvements in Telegraph-Instruments, of which the following is a specification.

The object of the invention is to provide a sensitive receiving telegraphic instrument suitable for cables or other lines where feeble electric currents are used.

The general principle upon which the invention is constructed consists in placing a coil or solenoid of insulated wire in the circuit of a line and providing therefor a magnetic field of high intensity. This magnetic field preferably consists of two magnets placed one at either end of the solenoid and presenting different poles, so that the combined action of the four poles shall be to deflect the solenoid in one direction or the other as the polarity of the line-current may determine. The solenoid is pivoted or suspended at its center and is free to move thereon. One pole of one magnet at one end of the solenoid is partially within the solenoid, the pole-piece preferably occupying a section within such solenoid of about one-fourth its internal space. The other pole of this magnet is external to such solenoid and preferably covers about one-fourth the external surface of such solenoid, the surface so covered being that most remote from the pole within the solenoid. The magnet at the other end of the solenoid is similarly arranged in its relation thereto both internally and externally, the poles of the two magnets in their relation to each other being in reverse order, as stated and well understood.

The invention is illustrated in the accompanying drawings, in which—

Figure 1 is a top view of an instrument embodying the invention. Fig. 2 is a section through the line 2 2 of Fig. 1. Fig. 3 is a section through the line 3 3 of Fig. 1. Fig. 4 is a sectional view of a portion of the apparatus as seen from the top, and Fig. 5 is a plan of a double instrument similar to that shown in Fig. 1.

Referring to the drawings, A A are perma-

nent magnets; B B, solenoids mounted so as to be within the field of force of the magnets A. L L are the main-line wires; L' L', the local-circuit wires. The magnets A A may be compound, as shown in Figs. 2 and 3; and the invention will be described principally with reference to Figs. 1, 2, 3, and 4. The solenoid is pivoted at *b*, and has a sufficient motion to open and close the local circuit through the arm *b'* and the contact-points *b*².

The invention consists, principally, in the peculiar shape of the pole-pieces of the magnets A and the manner in which they are presented to the respective ends of the solenoid B. Thus it will be seen that one of the poles of each magnet is extended so as to partly cover one end of the solenoid, while the other pole of the same magnet is of such shape as to extend within the solenoid and to be nearest that portion of the solenoid which is farthest removed from the portion which is covered by the other pole of the magnet. Thus the portions *a* and *a'*, respectively, of the magnets A A in Figs. 1, 2, 3, and 4 extend without and within the solenoid B. The magnets A A are so placed that their poles are presented to the two ends of the solenoid in an alternate manner, and hence when a current passes over the main line L and through the solenoid it is affected by the combined action of the magnetic poles of both magnets according to the direction of such current. The ends of the solenoid are accordingly attracted by the poles *a a* and repelled by the poles *a' a'*, or vice versa.

The local circuit can be readily traced through the arm *b'*, contact-points *b*², and arm C. The arm C is attached to the post C' by friction upon the pivot *c*, and can therefore yield slightly to the motion of the arm *b'*, which is, as well known, an advantage in instruments of this description.

Referring now to Fig. 5, it will readily be seen how the same principles are applied to the double instrument shown. The solenoids B B are attached to the arm F, which latter is pivoted at *f* delicately. The main circuit L is led through the two solenoids in series and the local circuit L' is connected with the arm F and is made and broken at the points *b*, held in the movable arm C², frictionally at-

tached to the post C³. As the poles of the magnets A A A A are arranged alternately, it will be seen how by their combined action upon the two solenoids as a current over the
5 main line L passes through them the intensity of the field is practically doubled over that shown in Fig. 1. The retractile springs s and s' are arranged and adjusted in the manner found necessary for the best operation of the
10 instrument.

I claim as my invention—

The combination of a solenoid, two magnets applied to the respective ends thereof, a pole of one magnet being partially within the

solenoid at one end and the other pole of said 15 magnet partially surrounding the same end of such solenoid, the poles of the other magnet being similarly arranged within and without the other end of the solenoid, but in reverse order of polarity.

In testimony whereof I have hereunto subscribed my name this 7th day of September, 20
A. D. 1888.

CHARLES G. BURKE.

Witnesses:

DANL. W. EDGECOMB,
CAROLINE E. DAVIDSON.